Status of Event-Builder & Level-3 PC Farm

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for the MIT group

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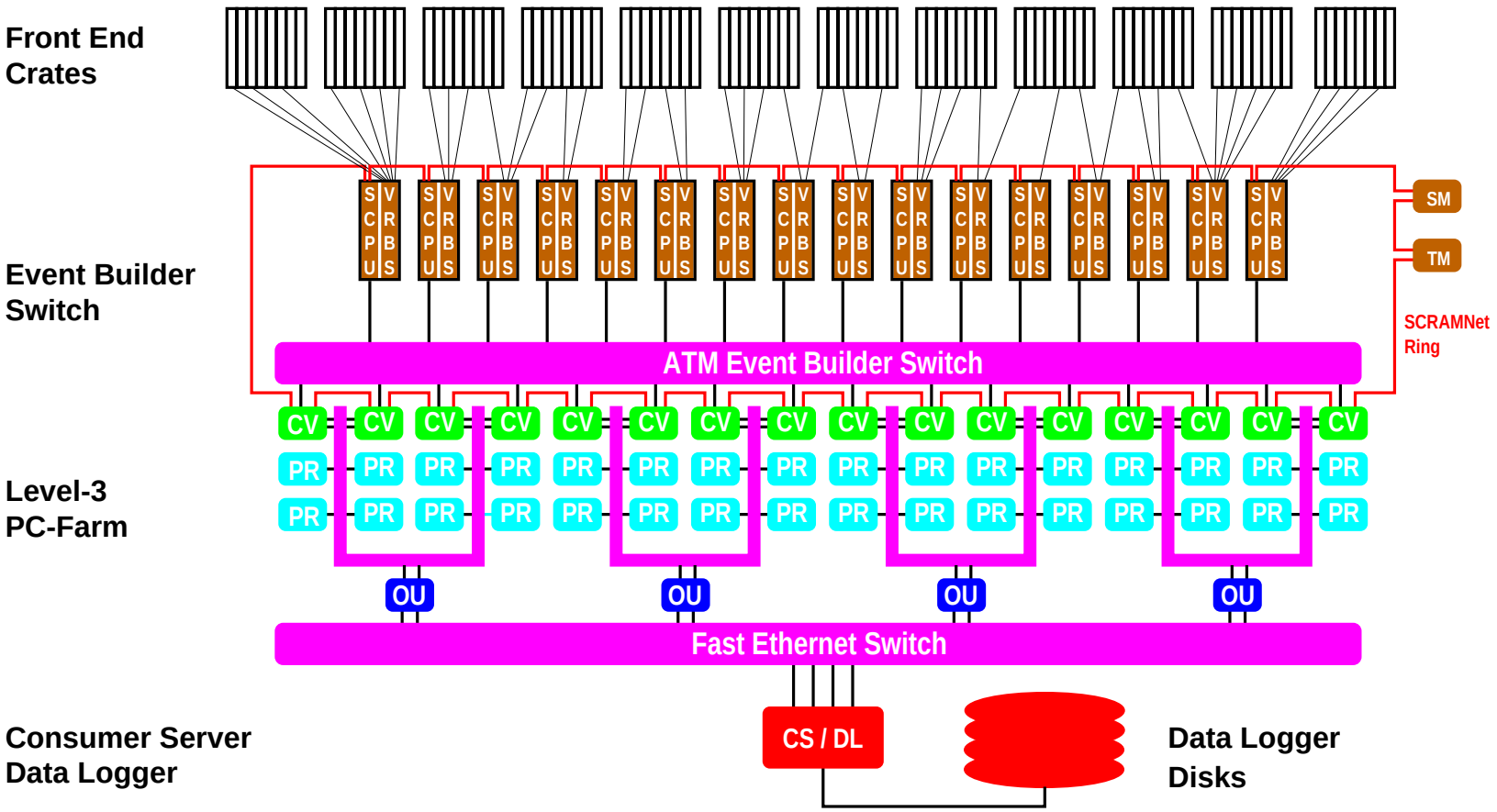
System Overview



Hardware Status

- Infrastructure:
  - industrial shelving 3^{rd} floor:
    - Capacity for 100 PC's now, 400 PC's in the future.
    - ATM switch, up to 20 FastEthernet switches.
    - 6U VME crate (for Scanner Manager)
  - "clean out" cabling plant 3^{rd} floor.
  - network cabling done for FastEthernet/ATM/SCRAMNet on $1^{st}, 2^{nd}, 3^{rd}$ floor.
- Event Builder Hardware:
  - 15 SCPUs, 16 converter nodes, Scanner Manager, 32 port ATM switch, 24 port FastEthernet switch.
  - all cabled up in final configuration.
  - Missing: some 6U→9U adapter boards.
  - Problem: Not all PC's working properly (yet).
- Level-3 PC Farm Hardware:
  - 32 processor nodes, 4 output nodes, 5×24 port FastEthernet switches.
  - all cabled up in final configuration.

Hardware ready for Engineering Run !

Performance Limits

Rate Division Method

To max out on converter node (CV) ATM link bandwidth:
Each CV receives ($\sim$ 16MB/s /# of SCPUs) from each SCPU.

To max out on SCPU ATM link bandwidth:
Each SCPU sends ($\sim$ 16MB/s /# of CVs) to each CV.

Max out ATM link utilization for symmetric system.

Max trigger rate:

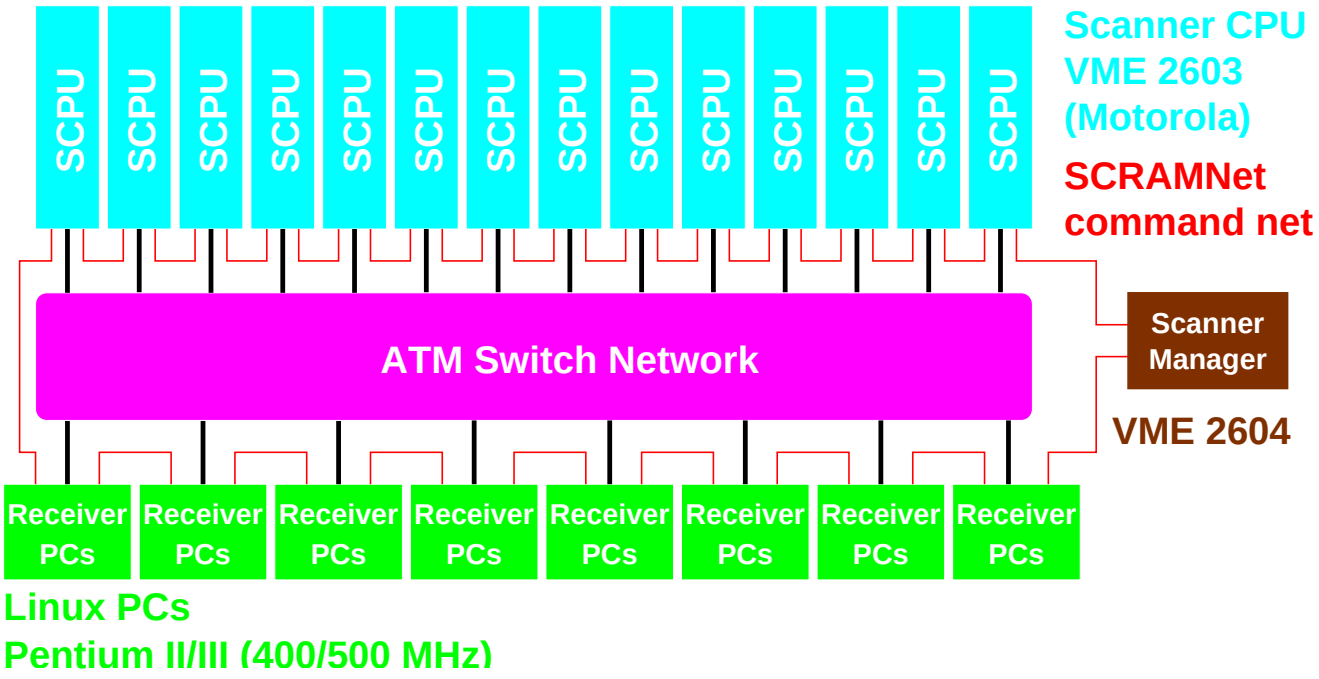
$$\frac{\text{ATM link bandwidth}}{\langle\text{event size}\rangle/\#\text{ of SCPUs}}$$

15 SCPUs, 250kB event size

$\Rightarrow \sim 1000$Hz trigger rate.

Performance Test: Test Setup

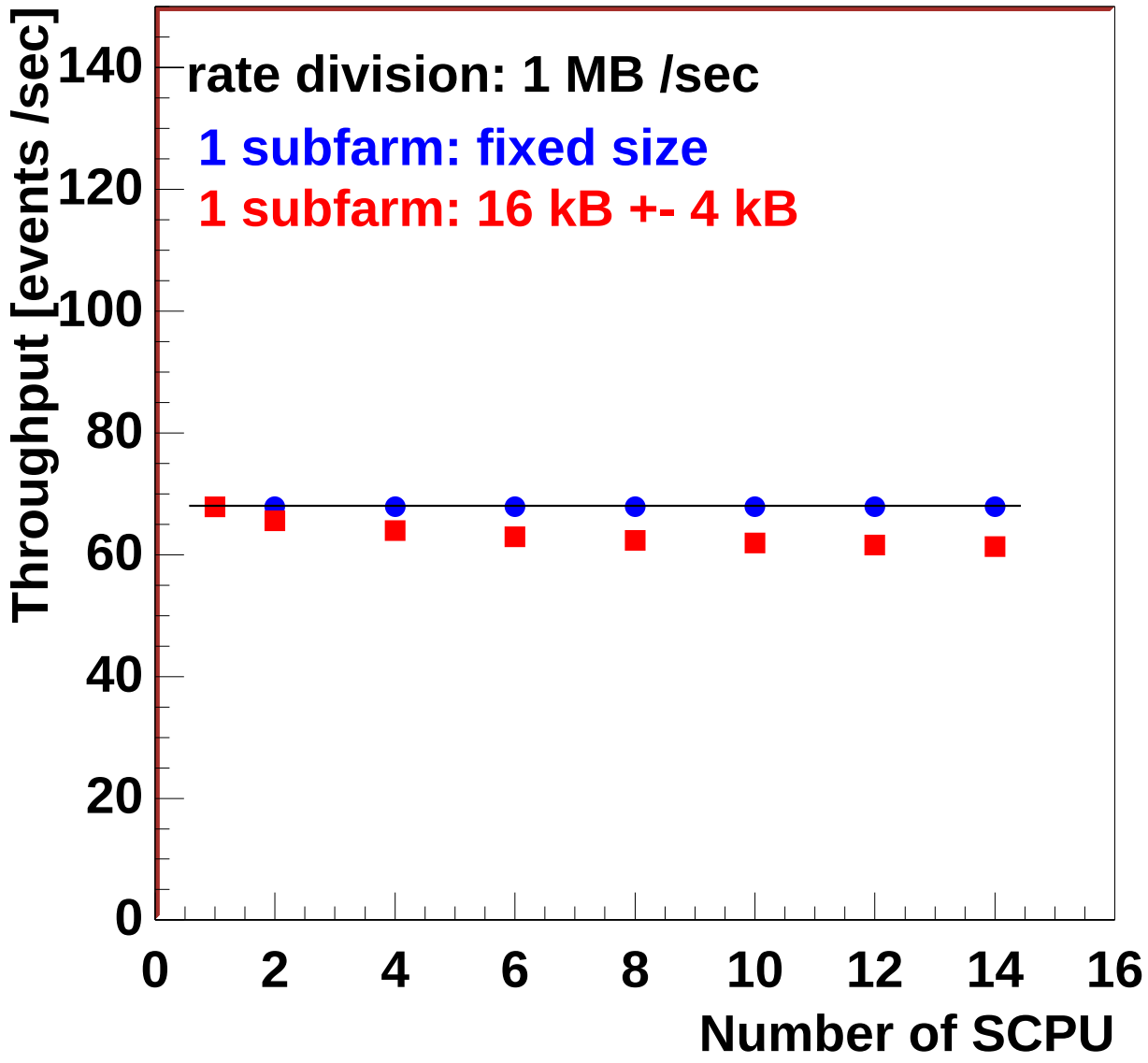
14×8 System
1 of the 8 subfarms with 4 proc + 1 out



Rate division: SCPUs sending rate per receiver is 1 MB/s
Realistic event fragment size: 16 kB $\pm$ 4 kB

$\Rightarrow$ expect $\sim$ 65Hz per converter node
$\Rightarrow$ expect $\sim$ 1000Hz max for full system !

Performance Test: "Event Building"

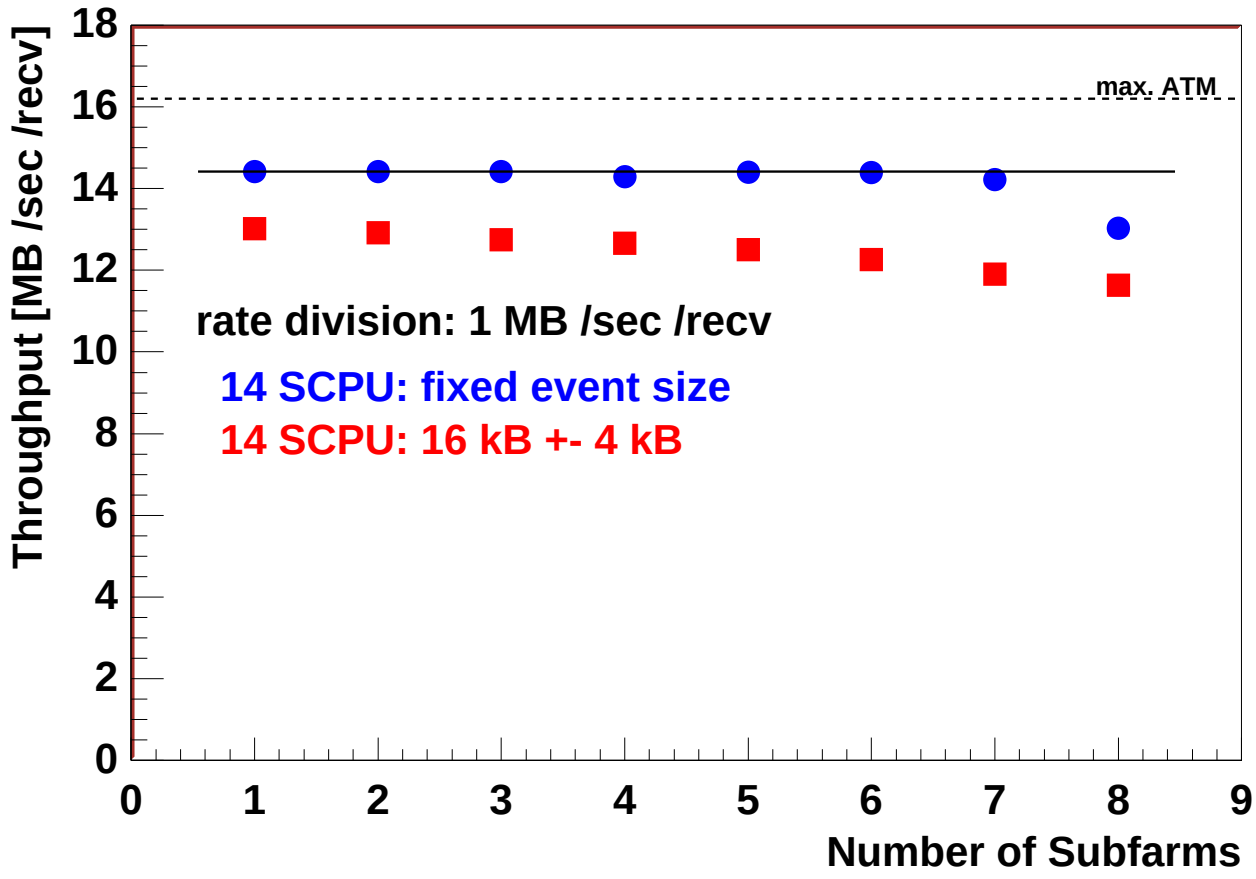


Throughput (Events/sec) flat vs # of fragments per event

$\Rightarrow$ Event Building without performance penalty

Projected Total Rate: 16 recv $\sim$ 1000 Hz

Performance Test: "Event Distribution"



Throughput/receiver (not quite) flat vs # of receivers.

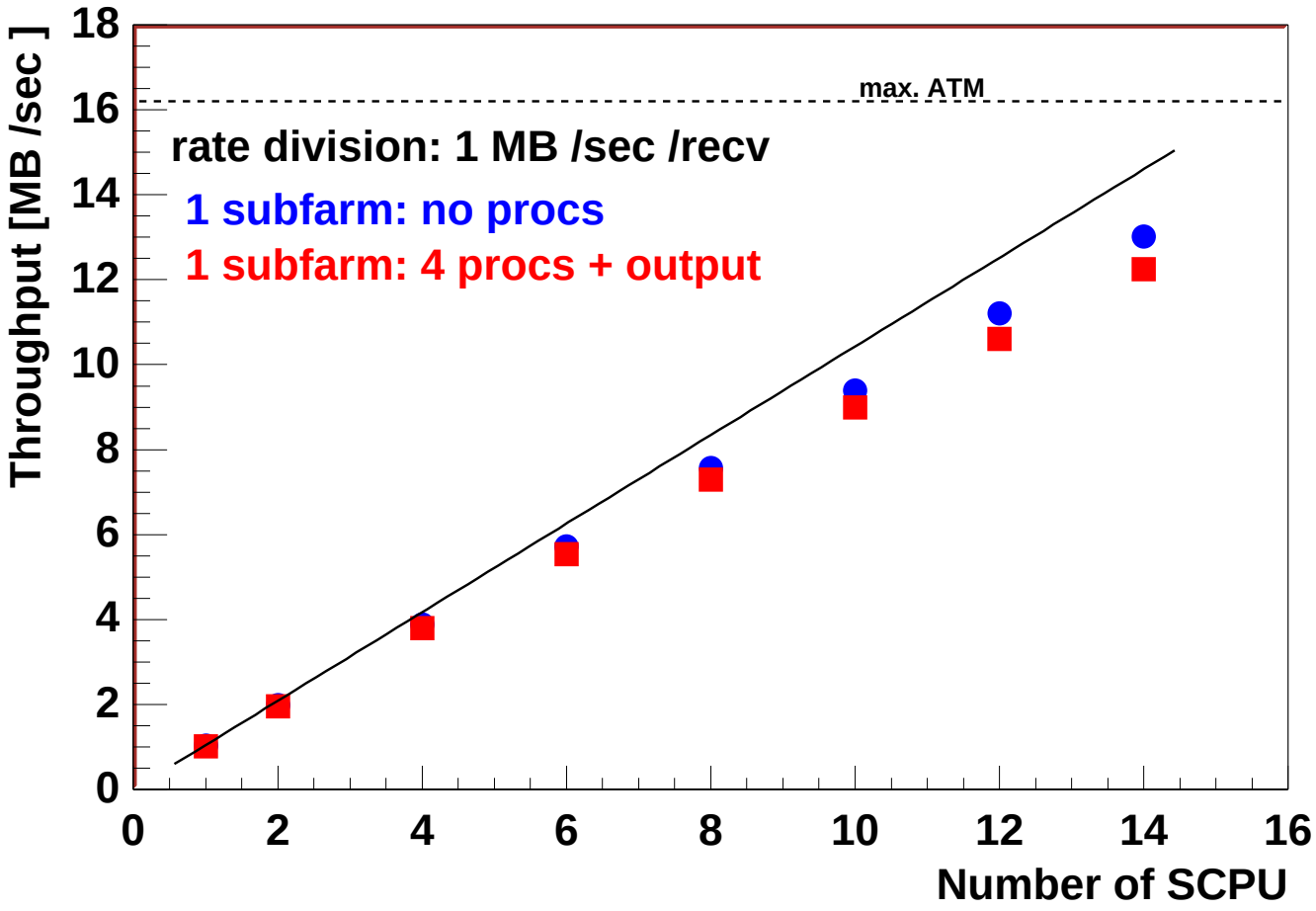
$\Rightarrow$ Farm's "Parallelism" not (yet) perfect.

Performance degradation $\rightarrow$ more studies needed.

Though: 11.5 MB/s $\times 8 = 92$MB/s $\rightarrow\sim$ 400Hz for 250kB evts.

Run II baseline goals already met !!!

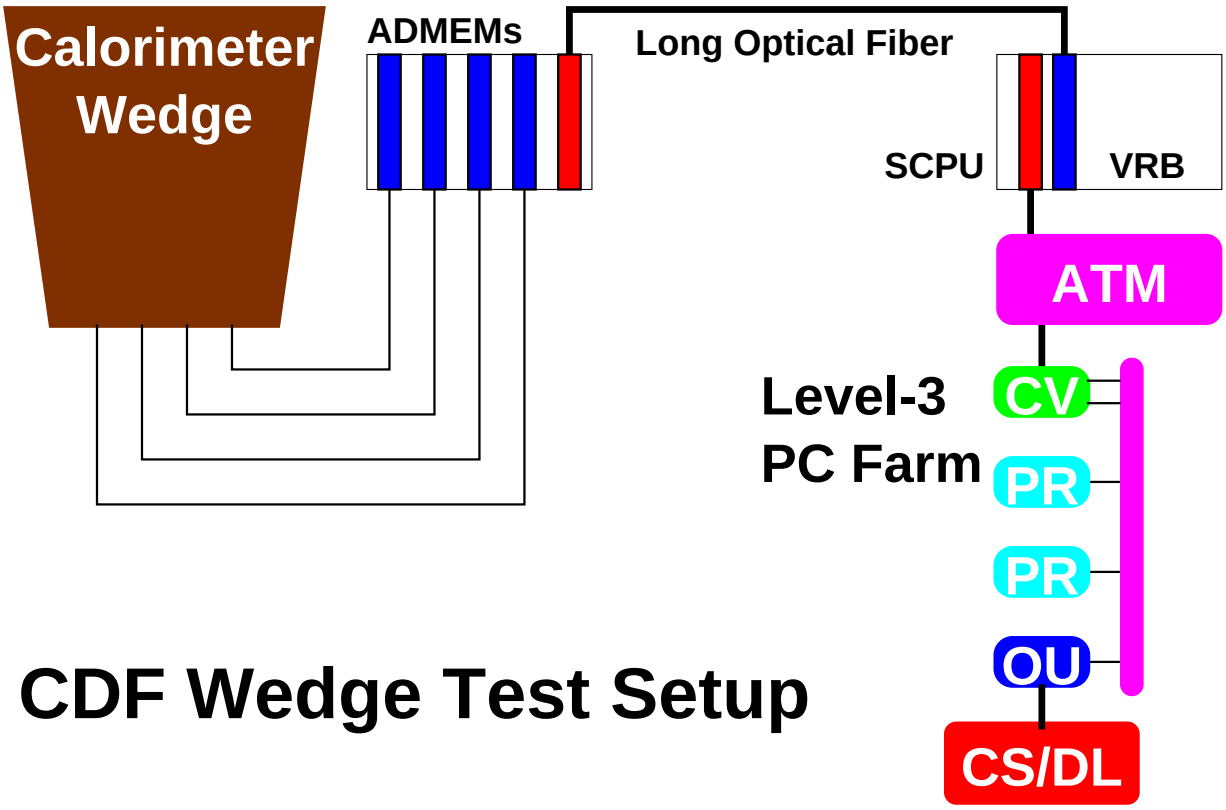
Performance Test: "Event Processing"



Small degradation observed when procs + out attached

$\Rightarrow$ needs further study !

Connectivity Tests



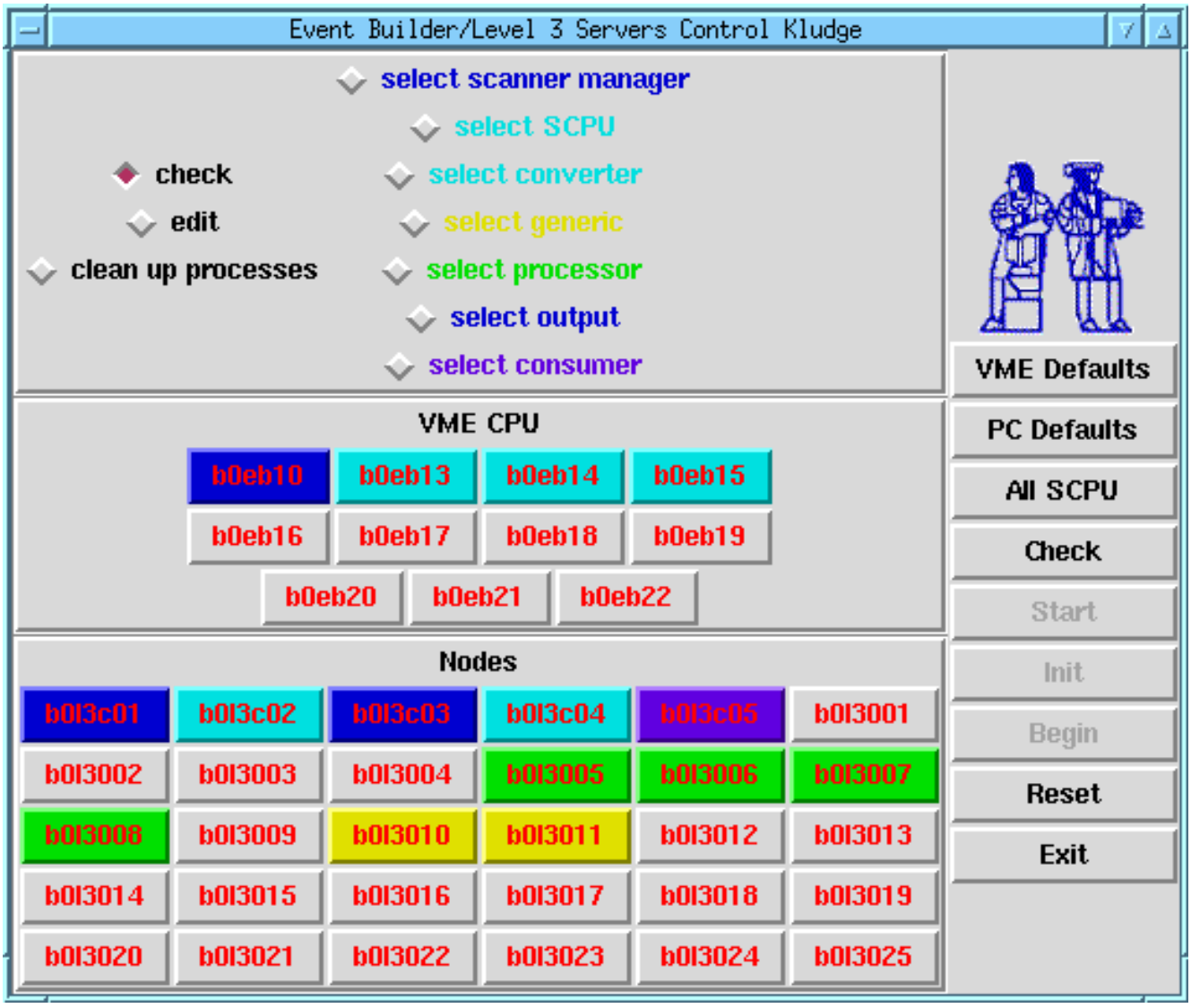
CDF Wedge Test Setup

Wedge Test in Spring → OK
SVX, ADMEM in Oct. → OK
TDC in Oct. → OK
Shower Max in Oct. → OK

Work In Progress → see Frank Chlebana's talk

Control and Monitoring

Working control program exists:



Integration with Run Control in progress.

Near Term Priorities

3 System (Cal,TDC,SVX) Test: November

- Complete Connectivity Tests
- Integrate Run Control
- Integration with Trigger Manager

Beyond November

- Full System Tests
- Integrate Run Control
- Interface with Database
- Online Monitoring

Event-Builder and Level-3 PC farm well on track.
Though, a lot of work still to be done.